



AS MEX.236A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Ivo Raaijmakers et al. ) Group Art Unit 1763  
Appl. No. : 09/658,784 )  
Filed : September 11, 2000 )  
For : LOADLOCK WITH INTEGRATED )  
PRE-CLEAN CHAMBER )  
Examiner : Rudy Zervigon )

ON APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANTS' BRIEF

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Applicants, in the above-captioned patent application, appeals the final rejection of Claims 61, 67 and 103-116. This appeal is proper under 35 U.S.C. §134 and 37 C.F.R. § 191(a).

This appeal brief is filed in triplicate. A check in the amount of \$330 is included to cover the fee for filing the appeal brief pursuant to 37 C.F.R. § 1.17(c). Please charge any additional fees which may be required to Deposit Account No. 11-1410.

I. STATEMENT OF INTEREST

Pursuant to 37 C.F.R. § 1.192(c)(1), Applicants hereby notifies the Board of Patent Appeals and Interferences that ASM America, Inc., a Delaware corporation with its principle place of business at 3440 University Drive, Phoenix, Arizona, has acquired the entire right, title and

interest to the above-captioned patent application by virtue of an assignment from the inventors. That assignment is recorded in the U.S. Patent and Trademark Office at Reel/Frame 011389/0046.

## II. RELATED APPEALS AND INTERFERENCES

Pursuant to 37 C.F.R. § 1.192(c)(2), Applicants hereby notifies the Board of Patent Appeals and Interferences that Applicants, Applicants' legal representative, and ASM America, Inc., are unaware of any appeals or interferences that will directly affect, or will be directly affected by, or have any bearing on the Board's decision in the pending appeal.

## III. STATUS OF THE CLAIMS AND AMENDMENTS

Claims 61, 67 and 103-116 are pending.

Claims 61, 67 and 103-116 stand rejected under 35 U.S.C. § 102(e) upon the grounds set forth in the Final Office Action mailed August 13, 2003.

Claims 108, 109, 115 and 116 have been amended to correct an informality in a separate paper.

Claims 61, 67 and 103-116 are the subject of this appeal.

In accordance with 37 C.F.R. § 1.192(c)(9), a copy of the claims involved in the appeal are contained in the Appendix (Appendix A) attached hereto.

## IV. SUMMARY OF THE INVENTION

An embodiment of the present invention relates to a system for processing substrates. The system comprises a load lock chamber that includes a lower portion having a first inner width and an upper portion having a narrower second inner width. The load lock chamber includes a first port and a second port. Each of the ports are sized to pass substrates therethrough. The load lock chamber further comprises a moveable platform configured to support at least one substrate thereon. The moveable platform has a width less than the first inner width and greater than the second inner width to enable selectively sealing the upper portion with at least one substrate

supported on the platform. A substrate handling chamber selectively communicates with the load lock chamber through the first port. At least one process chamber selectively communicates with the substrate handling chamber. The first port is located in the upper portion of the load lock chamber. In some embodiments, the system includes an auxiliary processing system that is in communication with the upper portion of the load lock such that the upper portion of the load lock may be used for pre or post processing.

This embodiment provides a novel system for processing substrates. In the recited arrangement, a substrate may be loaded into the lower level of the load lock and raised into the upper portion of the load lock. In this manner, the substrate may be sealed in a smaller, more controllable environment before the substrate is transferred into the processing environment from the upper portion.

With reference to a specific embodiment of the invention, which is described in the Specification at page 14, line 16 to page 16, line 5 and illustrated in Figures 10A-10F, a load lock chamber 300 includes a first chamber 22 and an upper, auxiliary chamber 24. Page 14, lines 19-23 and Figures 10A-10F. The first chamber 22 has a first inner width and the auxiliary chamber 24 has a second, narrower inner width. *Id.* A first port (i.e., the handling chamber port 36) is located in the auxiliary housing portion 30 of the load lock 300 and communicates directly with the auxiliary chamber 24. Page 14, lines 21-25. A second port (i.e., the load lock port 34) is located in the first housing portion 28 of the load lock 300 and opens into the first chamber 22. *Id.* An elevator plate 26, with a width less than the first inner width and greater than the second inner width, moves between a first position and a second position wherein the elevator plate 26 substantially seals the auxiliary chamber 24 from the first chamber 22.

With reference to Figure 6A, the handling chamber port 36 is in communication with the wafer handling module 82, which is, in turn, in communication with a processing module 84. See

Page 10, lines 1-13. Accordingly, with the elevator plate 26 in the second position, the substrate may be removed from the load lock 300 through the handling chamber port 36 and transferred to the processing chamber 84. See page 15, lines 5-8.

Thus, in the illustrated embodiment, the wafer enters the lower chamber of the load lock; the elevator plate lifts the wafer up into the smaller, upper chamber, which can be readily purged; and the wafer is transferred from the upper chamber into the handling chamber and on to a processing chamber. The pending claims reflect this novel arrangement. In particular, independent Claims 61 and 67 recite, in part, a substrate handling chamber selectively communicating with the load lock chamber through a first port with at least one process chamber selectively communicating with the substrate handling chamber, wherein the first port is located in the upper portion.

#### V. ISSUE PRESENTED ON APPEAL

The following issue is presented: Whether U.S. Patent No. 6,234,107 was properly used to reject Claims 1-33 under 35 U.S.C. § 102(e).

#### VI. GROUPING OF THE CLAIMS

For the purposes of this appeal only, all of the appealed claims stand or fall together so as to simplify and narrow the issues on appeal. While the patentability of each claim will not be discussed individually, each claim does present distinct issues of patentability and Applicant respectfully reserves the right to separating argument in future continuing applications.

Group 1: Claims 61, 67 and 103-116

#### VII. DISCUSSION OF THE REFERENCES RELIED UPON BY THE EXAMINER

In rejecting the claims, the Examiner relied upon the following references:

Tanaka et al.(U.S. Patent No. 6,234,107) (Appendix B)

With reference to Figure 6, Tanaka et al. disclosed an auxiliary vacuum chamber 12. The chamber 12 comprises a container 50 having a protruding part 51 in the upper portion thereof and

having a base part 60 in the lower portion thereof. Col. 6, lines 56-62. A wafer holder 53 can be moved vertically by a drive mechanism. *Id.* When the wafer holder 53 is raised, the wafer holder 53 is brought into tight contact with the inside wall portion of the container 50 to form a hermetically closed space 52. In the upper portion, a gate valve 14' is provided between the protrusion 51 and the wafer transfer chamber 16. Col. 6, lines 65-67. The wafer transfer chamber is, in turn, connected to cassette chambers 20, 21. Col. 3, lines 65-67. An opening 10 is provided on the base part 60 of the chamber 12 for communicating with the substrate handling chamber 4, which is in turn in communication with the processing chambers 1, 2, 3. See Col. 7, lines 1-3 and Figure 1.

Thus, Tanaka et al. disclosed a load lock chamber 12 with upper and lower portions, 52, 60. The port identified by reference number "10" is in communication processing chambers 1, 2, 3 through the conveying chamber 4 and is positioned on the lower portion 60 of the load lock chamber 12. See Col. 7, line 30-32 and Figure 6 (emphasis added). The port identified by the reference number "14'" is in communication with the wafer transfer chamber 16, which is in communication with the cassette chambers 20, 21, and is positioned on the upper portion 52 of the load lock chamber 12. See Col. 7, lines 20-25 and Figure 6 (emphasis added).

## VIII. ARGUMENT

### A. Claims 61, 67 and 103-116 are not anticipated by Tanaka et al.

Claims 61, 67 and 103-116 stand rejected under 35 U.S.C. § 102(e) as anticipated by Tanaka et al. However, Tanaka does not show every element of these claims. As such, the rejection of Claims 61, 67 and 103-116 is improper.

An anticipation rejection under Section 102(b) is proper only if a single reference shows every element of the claim, arranged as in the claim. MPEP §2131 (emphasis added). Claims 61 and 67 both recite, in part, that the first port is located on the upper portion of the load lock chamber.

The first port, in turn, communicates between the load lock and the substrate handling chamber, which in turn communicates with at least one process chamber.

Applicants submit that Tanaka does not include “a first port”, i.e., a port located on the upper portion of the load lock chamber, that communications between the load lock and a substrate handling chamber, which in turn communicates with at least one process chamber. In fact, Tanaka teaches the opposite configuration. The port identified by the reference number “14” in Figure 6 does not communicate with a substrate handling chamber that communicates with the process chambers. Rather, the part identified by the reference number “14” communicates with a wafer transfer chamber 16 that communicates with cassettes 17 for storing wafers, not with process chambers(s).

In rejecting the pending claims, the Examiner incorrectly identified the “first port” in Tanaka as the component identified by the reference number “14”. In reality, Figure 1 of Tanaka plainly shows that the port in communication with the processing chambers 1, 2, 3 is indicated by the reference number “10”. Thus, the Examiner has incorrectly identified the component identified by the reference “14” as the port in communication with the processing chambers 1, 2, 3. Put another way, the Examiner has identified the wrong wafer transfer chamber 16 as being in communication with the processing chambers 1, 2, 3. That is, while Tanaka’s transfer chamber 16 is in communication with the port 14’, and the port 14’ of Figure 6 is in communication with the upper chamber, this transfer chamber 16 does not selectively communicate with at least one process chamber. As such, Tanaka fails to meet all the limitations of Claims 61 and 67.

Moreover, Applicants submit that the claimed arrangement represents a significant distinction over Tanaka. Tanaka provides wafers through the port 14’ to load the wafer in the upper position. Then, before transferring the wafer into the process chamber, the elevator plate

55 is lowered so that the load lock chamber becomes a bigger chamber and more subject to impurities before it is transferred into the processing environment. See Tanaka at Col. 7, lines 19-32.

In contrast, the recited arrangement of Claims 61 and 67 is capable of loading the wafer at a lower level, raising the wafer into the upper portion and thereby sealing the wafer in a smaller, more controllable environment before transferring the wafer into the processing environment from the upper portion. This sequence is not possible with the structure taught by Tanaka. Moreover, neither Tanaka nor any other reference of record teaches or suggests modifying the structure of Tanaka to meet the limitations of independent Claims 61 and 67.

#### IX. CONCLUSION

Nothing in the prior art discloses, teaches or suggests the invention recited by the claims discussed above. In combination, the applied references also do not also art disclose, teach or suggest the invention recited by the claims discussed above. In addition, the art of fails to supply any motivation or suggestion to modify the applied references to include the limitations of the claims. The applied combinations of references therefore is improper.

The applied reference does not anticipate the claimed invention. The final rejection of Claims 61, 67 and 103-116 based on anticipation should be reversed. Favorable action to this end therefore is most respectfully solicited.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR

Dated: 6-14-04

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## APPENDIX A

61. **(Previously Presented)** A system for processing substrates, comprising

a load lock chamber including a lower portion having a first inner width and an upper portion having a narrower second inner width, the chamber including a first port and a second port, each of the ports sized to pass substrates therethrough, the load lock chamber further comprising a moveable platform configured to support at least one substrate thereon and sized to have a width less than the first inner width and greater than the second inner width to enable selectively sealing the upper portion with the at least one substrate supported thereon;

a substrate handling chamber selectively communicating with the load lock chamber through the first port; and

at least one process chamber selectively communicating with the substrate handling chamber, wherein the first port is located in the upper portion.

67. **(Previously Presented)** A system for processing substrates, comprising

a load lock chamber including a lower portion having a first inner width and an upper portion attached to the lower portion and having a narrower second inner width, the chamber including a first port and a second port, each of the ports sized to pass substrates therethrough, the load lock chamber further comprising a moveable platform configured to support at least one substrate thereon and sized to have a width less than the first inner width and greater than the second inner width to enable selectively sealing the upper portion with the at least one substrate supported thereon;

an auxiliary processing system selectively communicating with an opening in the upper portion;

a substrate handling chamber selectively communicating with the load lock chamber through the first port; and

at least one process chamber selectively communicating with the substrate handling chamber, wherein said first port opens into said upper portion and said second port opens into said lower portion.

103. **(Previously Presented)** The system of Claim 61, further comprising a substrate carrier that is attached to said moveable platform.



104. **(Previously Presented)** The system of Claim 61, further comprising a substrate carrier on said moveable platform, the substrate carrier being adapted to receive at least a pair of substrates

105. **(Previously Presented)** The system of Claim 104, wherein said substrate carrier is located on top of said moveable platform and said moveable platform is configured to move vertically in said load lock chamber.

106. **(Previously Presented)** The system of Claim 61, wherein the upper portion includes treatment gas injectors that communicate with a source of HF vapor.

107. **(Previously Presented)** The system of Claim 61, wherein the upper portion includes treatment gas injectors that communicate with an oxidant source.

108. **(Previously Presented)** The system of Claim 61, wherein said load lock chamber further includes heating elements.

109. **(Previously Presented)** The system of Claim 108, wherein said heating elements are located within said upper portion.

110. **(Previously Presented)** The system of Claim 67, further comprising a substrate carrier that is attached to said moveable platform.

111. **(Previously Presented)** The system of Claim 67, further comprising a substrate carrier on said moveable platform, the substrate carrier being adapted to receive at least a pair of substrates

112. **(Previously Presented)** The system of Claim 111, wherein said substrate carrier is located on top of said moveable platform and said moveable platform is configured to move vertically in said load lock chamber.

113. **(Previously Presented)** The system of Claim 67, wherein the upper portion includes treatment gas injectors that communicate with a source of HF vapor.

114. **(Previously Presented)** The system of Claim 67, wherein the upper portion includes treatment gas injectors that communicate with an oxidant source.

115. **(Previously Presented)** The system of Claim 67, wherein said load lock chamber further includes heating elements.

116. **(Previously Presented)** The system of Claim 115, wherein said heating elements are located within said upper portion.